

MANO

The Master's degree in Physics aims at forming students with specific advanced skills in different areas of modern physics, based on a solid interdisciplinary scientific background. Graduates in Physics are appreciated for their open-minded, multi-disciplinary approach and their ability to apply scientific method to the analysis and resolution of complex problems, in various fields of physics as well as in other science-related sectors. Graduates will be able to continue their education in Professional Masters' Programmes and/or Doctoral Schools worldwide, and career opportunities in Italian and foreign public agencies or private companies in the field of:

- Research and development
- Applications and technological innovation
- Scientific outreach and teaching

More specifically, The MANO Curriculum will lead the student across an exciting path in the study of Condensed Matter Physics, with particular emphasis on the properties of nanostructures. "MANO" is the Italian word for "hand". Nanoscience is the study of structures and materials on the scale of nanometers, it is related to the possibility of handling matter at the nanoscale.

At the end of the course, students will: have in-depth and up-to-date understanding of all the experimental and theoretical aspects of condensed matter physics; manage advanced experimental and modelling tools for the analysis of advanced materials and nanostructures; apply scientific method and techniques to the resolution of problems.

MANO

MASTER'S DEGREE IN PHYSICS

Curriculum: MATERIALS PHYSICS & NANOSCIENCE
(MANO)

SECOND CYCLE DEGREE PROGRAMME/MASTER
UNIVERSITY OF BOLOGNA

Web-page:

<https://corsi.unibo.it/2cycle/Physics>

PROGRAMME DIRECTOR:

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TUITION FEE: about € 3,000.00 / year

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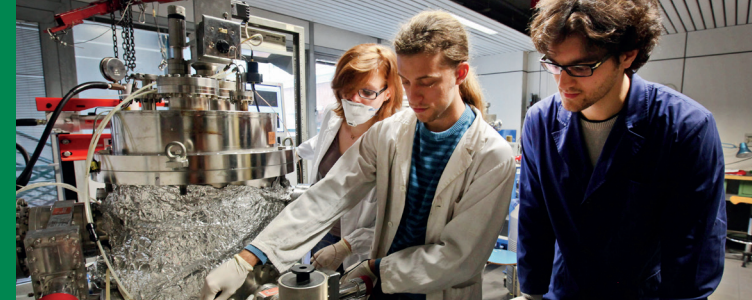
ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
SCHOOL OF SCIENCE

SCHOOL OF SCIENCE

PHYSICS
CURRICULUM
IN MATERIALS
PHYSICS
& NANO
SCIENCE

SECOND CYCLE
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COURSE STRUCTURE

I year	ECTS
Compulsory Classes	12
Laboratory of Condensed Matter Physics	6
Symmetries, Electrons and Phonons	6
Elective Classes in Materials Physics and Nanoscience	36
Magnetism and Superconductivity	6
Microscopic Kinetics and Thermodynamics	6
Laboratory of Nanoscience and Nanotechnology	6
Charge Transport and Optics in Condensed Matter	6
Interactions and Correlations in Condensed Matter	6
Computational Materials Physics	6
Semiconductor Materials and Nanostructures	6
X-Ray and Synchrotron Radiation Physics	6
Elective classes in other related fields of Physics	12
II year	ECTS
Elective Classes from any course of Master in Physics or related to Materials Science	12
Transversal Skills for Physics-related Professions	6
Advanced Professional and Research Skills in Physics	6
Final Dissertation (inclusive of stage and/or periods abroad)	36

During the first year of the programme, students acquire a solid background in all areas of condensed matter physics, with special emphasis on the properties of nanostructures.

During the second year of the programme, students develop cross-cutting skills in project writing, innovation, scientific communication and outreach. At the end of the course, students shall produce and orally defend an original research project, developed within a research group of the Department, possibly in collaboration with other public science agencies or private companies in Italy or abroad.

Career Opportunities

The MANO curriculum is designed for students seeking an international career in different fields: scientific research, advanced technology, new materials and devices. The MANO Course will also prepare for further studies at PhD level and academic or professional careers in leading Universities or other research-oriented public and private organisations. At PhD level, it is worth mentioning that graduates of the MANO curriculum may access the PhD programmes in both Physics and Nanoscience for Medicine and Environment, which was recently activated at the University of Bologna. Today, research in nanoscience requires qualified experts with cross-disciplinary expertise, able to manage, generate and contribute to the development of innovative materials and devices able to respond to the many challenges of society, such as the development of the low carbon economy, secure and sustainable environmental protection, the development of low cost and low power consumption sensors and electronics.

These challenges can benefit from experts in the field of materials physics and nanoscience.

Entry Requirements

To attend the Master in Physics is necessary to have:

- a Diploma of a First Cycle Degree obtained in Italy or abroad and recognized to be equivalent, in one of the following classes:
 - degree programme in class L-30 (pursuant to DM 270/2004) Physics Sciences and Technology;
 - degree programme in class XXV Physics Sciences and Technology (pursuant to DM 509/99);
 - 4-year degree programme in Physics and in Astronomy from the previous degree programme system
- knowledge of English at level B2.

To profitably attend the Programme, students must possess fundamental skills in mathematics and a good understanding of the phenomenology and models of classical and modern physics, including the fundamentals of micro-physics applied to particle physics and condensed matter. They should also have laboratory experience including the use of basic instruments and data acquisition and processing, using computer-assisted techniques.

Admission is subject to the assessment of the candidate's personal knowledge based on the student's curriculum and/or an interview, according to the rules set by the Degree Programme Board and published on the web-page.